

In the claims:

Claims 1-10 (canceled)

11. (canceled)

12. (canceled)

13. (canceled)

14. (previously presented) : An improved speech recognition system comprising:

a speech recognizer; and

a source normalization model coupled to said recognizer for recognizing incoming speech; said model derived by a method of source normalization training for HMM modeling comprising the steps of:

a) providing an initial speech recognition model and

b) performing on said initial speech recognition model the following steps to get a new speech recognition model:

b₁) estimation of intermediate quantities;

b₂) performing re-estimation to determine probabilities;

b₃) deriving mean vector and bias vector; and

b₄) solving jointly for mean vector and bias vector.

15.(previously presented) : The recognizer of Claim 14 including the step b₅) of replacing old speech recognition model for the calculated ones and step c) determining after a new speech recognition model is formed if it differs significantly from the previous speech recognition model and if so repeating the steps b₁-b₅.

16. (previously presented) : The recognizer of claim 14 wherein said step b_2 includes one or more of performing re-estimation to determine initial state probability, transition probability, mixture component probability and environment probability.

17. (previously presented) : The recognizer of claim 14 wherein said step b_2 includes performing re-estimation to determine initial state probability, transition probability, mixture component probability and environment probability.

18. (previously presented) : The recognizer of claim 14 wherein said step b_4 includes solving jointly for mean vector and bias vector using linear equations and determining variances and transformations.

19. (previously presented) : The recognizer of claim 17 wherein said step b_4 includes solving jointly for mean vector and bias vector using linear equations and determining variances and transformations.

20. (previously presented) : The recognizer of claim 19 including the steps of replacing old speech recognition model for the calculated ones and determining after a new speech recognition model is formed if it differs significantly from the previous model and if so repeating the steps b_1 - b_5 .

21. (previously presented) : A method of source normalization for modeling of speech comprising the steps of:

- a) providing an initial speech recognition model and
- b) performing on said initial speech recognition model the following steps to get a new speech recognition model:
 - b_1) estimation of intermediate quantities;
 - b_2) performing re-estimation to determine probabilities;

b₃) deriving mean vector and bias vector; and

b₄) solving jointly for mean vector and bias vector.

22. (previously presented) : The method of Claim 21 including the step b₅) of replacing old speech recognition model for the calculated ones and step c) determining after a new speech recognition model is formed if it differs significantly from the previous speech recognition model and if so repeating the steps b₁-b₅.

23. (previously presented) : The method of claim 21 wherein said step b₂ includes one or more of performing re-estimation to determine initial state probability, transition probability, mixture component probability and environment probability.

24. (previously presented) : The method of claim 21 wherein said step b₂ includes performing re-estimation to determine initial state probability, transition probability, mixture component probability and environment probability.

25. (previously presented) : The method of claim 21 wherein said step b₄ includes solving jointly for mean vector and bias vector using linear equations and determining variances and transformations.

26. (previously presented): The Method of claim 24 wherein said step b₄ includes solving jointly for mean vector and bias vector using linear equations and determining variances and transformations.

27. (previously presented) : The method of claim 26 including the step b₅) of replacing old speech recognition model for the calculated ones and step c) determining after a new speech recognition model is formed if it differs significantly from the previous speech recognition model and if so repeating the steps b₁-b₅.

28. (new) A method of source normalization for modeling of speech comprising the steps of:

providing an initial set of speech recognition models;

providing training data collected in a plurality of environments and

training the set of speech models jointly with a set of transformation parameters using a maximum likelihood optimization method such that the set of transformation parameters

capture the effects of environmental variations and the speech recognition model

parameters capture the effects of speech variations to provide a set of baseline HMMs;

providing adaptation speech from an environment of interest;

determining the likelihood of baseline HMM states at each frame of the adaptation by

using a Baum-Welch type processing and the baseline HMMs;

calculating the parameters of a set of transformations, that when applied to the HMMs

used in the previous step above results in maximizing the likelihood increase of the adaptation speech;

applying the transformation set to all of the baseline HMMs to form an adapted set of HMMs; and

using the adapted HMM model set to perform recognition of other utterances in the same environment as the adapted case.